IN THE CLAIMS

1. (Currently amended) An arrangement for iterative channel impulse response estimation in a system employing a transmission channel, comprising:

a channel impulse response estimator for producing iteratively from a received signal (y) a channel impulse response estimate ~~signal~~ ($\hat{p}$); and

a noise estimator for producing from the received signal (y) iteratively at each iteration K an estimated vector of ~~a~~ noise ~~estimate signal~~ samples $\hat{b}(K) = \underline{y} - H \cdot \hat{p}(K-1)$, where H is a matrix depending on known symbols, computing from the estimated vector of noise samples a vector of noise covariance taps $r(K) = win_k \cdot \sum_{l=k}^{L_y - 1} b_l(K) \cdot b_{l-k}(K)^*$ where win_k is a windowing function with a positive Fourier transform, and using the vector $r(K)$ to produce~~,~~

~~wherein said noise estimate signal comprises~~ a new matrix ~~(W)~~ $W(K)$ representing the inverse of noise covariance, and

said channel impulse response estimator is arranged, at each iteration (K), to respond to said new matrix ~~(W)~~ $W(K)$ representing the inverse of noise covariance to produce a single improved channel impulse response estimate $\hat{p}(K) = (H^H \cdot W(K) \cdot H)^{-1} \cdot H^H \cdot W(K) \cdot \underline{y}$.

2. (Currently amended) The arrangement of claim 1 wherein said new matrix ~~(W)~~ $W(K)$ representing the inverse of noise covariance is calculated at each iteration.

3. (Currently amended) The arrangement of claim 1 wherein said new matrix ~~(W)~~ $W(K)$ representing the inverse of noise covariance is selected from predetermined values corresponding to statistics of expected noise.

4. (Cancelled)

5. (Currently amended) The arrangement of claim ~~4 when dependent on claim~~ 3 wherein the predetermined values corresponding to statistics of expected noise are selected according to the noise types: Gaussian, upper adjacent interferer, lower adjacent interferer, or co-channel interferer.

6. (Previously presented) The arrangement of claim 1 wherein the channel impulse response estimator is arranged to produce the channel impulse response estimate ~~signal~~ ($\underline{\hat{p}}$) as a weighted least square function.

7. (Previously presented) The arrangement of claim 1 wherein the system is a wireless communication system.

8. (Previously presented) The arrangement of claim 7 wherein the system is a GSM system.

9. (Previously presented) The arrangement of claim 8 wherein the system is an EDGE system.

10. (Previously presented) A receiver for use in a system employing a transmission channel, the receiver comprising the arrangement of claim 1.

11. (Currently amended) A method~~,~~ for iterative channel impulse response estimation in a system employing a transmission channel, comprising:

providing a channel impulse response estimator for producing iteratively from a received signal ($\underline{y}$) a channel impulse response estimate ~~signal~~ ($\underline{\hat{p}}$); and

providing a noise estimator for producing from the received signal ($\underline{y}$) iteratively at each iteration K an estimated vector of ~~a~~ noise ~~estimate signal~~ samples $\underline{\hat{b}(K)} = \underline{y} - H \cdot \underline{\hat{p}(K-1)}$, where H is a matrix depending on known symbols, computing from the estimated vector of noise samples a vector of noise covariance taps $\underline{r(K)} = win_k \cdot \sum_{l=k}^{L_y-1} b_l(K) \cdot b_{l-k}(K)^*$ where win_k is a windowing function with a positive Fourier transform, and using the vector $\underline{r(K)}$ to produce~~,~~

~~wherein said noise estimate signal comprises~~ a new matrix ~~(W)~~ $\underline{W(K)}$ representing the inverse of noise covariance, and

said channel impulse response estimator, at each iteration (K), responds to said new matrix ~~(W)~~ $\underline{W(K)}$ representing the inverse of noise covariance to produce a single improved channel impulse response estimate ~~signal~~ ~~($\hat{\underline{p}}$)~~ $\underline{\hat{p}(K) = (H^H \cdot W(K) \cdot H)^{-1} \cdot H^H \cdot W(K) \cdot \underline{y}}$.

12. (Currently amended) The method of claim 11 wherein said new matrix (~~W~~ $\underline{W(K)}$) representing the inverse of noise covariance is calculated at each iteration.

13. (Currently amended) The method of claim 11 wherein said new matrix (~~W~~) representing the inverse of noise covariance is selected from predetermined values corresponding to statistics of expected noise.

14. (Cancelled)

15. (Currently amended) The arrangement of claim ~~14 when dependent on claim~~ 13 wherein the predetermined values corresponding to statistics of expected noise are selected according to the noise types: Gaussian, upper adjacent interferer, lower adjacent interferer, or co-channel interferer.

16. (Previously presented) The method of claim 11 wherein the channel impulse response estimator produces the channel impulse response estimate ~~signal~~ ($\hat{\underline{p}}$) as a weighted least square function.

17. (Previously presented) The method of claim 11 wherein the system is a wireless communication system.

18. (Previously presented) The method of claim 17 wherein the system is a GSM system.

19. (Previously presented) The method of claim 17 wherein the system is an EDGE system.

20. (Currently amended) A computer readable medium embodying a computer program element, the computer program element comprising instructions for performing a method for iterative channel impulse response estimation in a system employing a transmission channel, the method comprising:

providing a channel impulse response estimator for producing iteratively from a received signal (y) a channel impulse response estimate ~~signal~~ ($\hat{p}$); and

providing a noise estimator for producing from the received signal (y) iteratively at each iteration K an estimated vector of noise samples $\underline{\hat{b}(K)} = \underline{y} - H \cdot \underline{\hat{p}(K-1)}$, where H is a matrix depending on known symbols, computing from the estimated vector of noise samples a vector of noise covariance taps $\underline{r(K)} = win_k \cdot \sum_{l=k}^{L_y-1} b_l(K) \cdot b_{l-k}(K)^*$ where win_k is a windowing function with a positive Fourier transform, and using the vector $\underline{r(K)}$ to produce~~,~~

~~wherein said noise estimate signal comprises~~ a new matrix ~~(w)~~ $W(K)$ representing the inverse of noise covariance, and

said channel impulse response estimator, at each iteration (K), responds to said new matrix ~~(w)~~ $W(K)$ representing the inverse of noise covariance to produce a single improved channel impulse response estimate ~~signal~~ ~~($\hat{p}$)~~ $\underline{\hat{p}(K)} = (H^H \cdot W(K) \cdot H)^{-1} \cdot H^H \cdot W(K) \cdot \underline{y}$.